



U. S. Fish & Wildlife Service



# KLAMATH RIVER BASIN CONSERVATION AREA RESTORATION PROGRAM



Working to Restore Anadromous  
Fisheries of the Klamath River Basin  
FY 2003 Annual Report

## Introduction to the Klamath River Basin Conservation Area Restoration Program

The Klamath River Basin Fisheries Task Force (Task Force) was established by the Klamath River Basin Fishery Resources Restoration Act of 1986 (P.L. 99-552) to provide recommendations to the Secretary of the Interior on the formulation, establishment, and implementation of a 20-year program to restore the anadromous fish populations of the Klamath River Basin Conservation Area to optimal levels and to maintain such levels. The Klamath River Basin Conservation Area Restoration Program (Klamath Restoration Program) is administered for the Department of Interior by the U.S. Fish and Wildlife Service office in Yreka, California. Congress authorizes \$1 million per year to implement this program until 2006, when authorization will cease.

To administer the Klamath Restoration Program, the Yreka Fish and Wildlife Office performs the following functions: [1] provides staff support to the two Federal advisory committees: the Task Force, which provides guidance on implementation of the Klamath Restoration Program; and the Klamath Fishery Management Council (Council), which provides recommendations on the regulation of harvest; [2] coordinates, funds and assists restoration planning and implementation of restoration projects; [3] monitors and coordinates research evaluating anadromous fish populations; and [4] promotes partnerships that help to leverage additional funding for restoration in the Klamath River Basin. The Yreka Fish and Wildlife Office provides funds for restoration projects from the Klamath Restoration Program and other programs including the U.S. Fish and Wildlife Service, Jobs-in-the-woods, Partners for Fish and Wildlife Program, and Fish Passage Programs. See insert below for descriptions for these programs. This Annual Report summarizes restoration projects that were completed in 2003. Full reports of each project are available from the Yreka Fish and Wildlife Office.

The Jobs in the Woods Program is part of the U.S. Fish and Wildlife Service's contribution to the Northwest Forest Plan to participate in watershed restoration activities in northern California, Oregon, and Washington. The goals are to: 1) Support watershed restoration efforts on nonfederal lands, 2) contribute to the recovery of fish, wildlife, plant species, and their habitats, 3) complement ongoing watershed restoration efforts on federal lands, 4) provide employment and training opportunities to timber-dependent community workers, and 5) support a cooperative approach to watershed restoration.

The Partners for Fish and Wildlife Program is a technical and financial assistance program working with private landowners to restore wetlands, streams and river corridors, fish and wildlife habitats. The Program provides advice on the design and location of potential restoration projects, as well as financial assistance to implement the projects.

The Fish Passage Program provides funds to improve fish passage through water ways. Past projects have improved fish passage at culverts, repaired defective screens, and studied remedies to other fish passage problems. These projects have benefitted federal trust species (such as salmon, trout, and other species important to Tribal traditions), as well as

## Reimbursement for Direct Costs of Unimpaired Flows 1998-HP-04 Great Northern Corporation

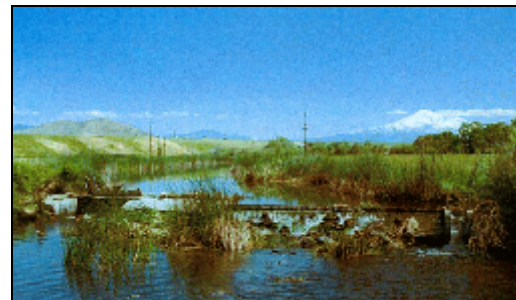
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In 1993, the Shasta Coordinated Resources Management and Planning Committee initiated a voluntary program of spring and early summer pulsed flows in the Shasta River, primarily to improve the survival of fall Chinook salmon, then at critically low levels. In 1998, the U.S. Fish and Wildlife Service through the Klamath River Basin Fisheries Task Force, provided some funds to help meet costs directly associated with that effort in



Dave Webb, Shasta CRMP Coordinator, removing flashboards during unimpaired flow.

order to reduce hurdles to its continued implementation. The Shasta CRMP had envisioned that the pulsed flows would be utilized as a stop-gap measure to compensate for high summer water temperatures and low levels of dissolved oxygen, with improvements in water quality seen as the needed permanent change that would make the pulsed flows unnecessary in the future.



Diversion dam downstream of the Hwy3 bridge over the Shasta River. Flashboard section is to left, area repaired following flood damage to right.

## Irrigation Runoff Measuring Devices 1998-HP-05 Great Northern Corporation

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Water from the Shasta River is used extensively for summer irrigation throughout the Shasta Valley. Most of the irrigation is done via either wild or partially controlled flooding, resulting in the creation of significant amounts of irrigation runoff returning to the Shasta River. Water quality is significantly affected, and consequently so is the survival of salmonids. Devising ways to minimize the adverse effects of this irrigation runoff is a complex process, but one of the first steps is to quantify the problem for a given irrigation, so that an appropriate scale of fix can be devised.

Funds for this grant from the U.S. Fish and Wildlife Service, through the Klamath River Basin Fisheries Task Force were used to purchase portable weirs and flow recording devices to allow the measurement of individual runoff sources preparatory to developing proper measures to deal with the runoff.



V-notch weir in place ready to measure relatively small runoff flow. Vertical pipe at center serves as stilling well for recording device inside it, and has staff gauge mounted on it.



**Shasta Weather Station  
1999-FP-10  
Great Northern Corporation**

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The climate of the Shasta Valley is in many ways unique. Several fishery efforts will benefit from access to climatological data generated within the Shasta Valley, including the development and improvement of a flow and temperature model for the Shasta River, and also efforts to fine-tune the application of irrigation water



Weather Station installed at Shasta Valley Wildlife area.

derived from the Shasta River. The Klamath River Basin Fisheries Task Force through the U.S. Fish and Wildlife Service has provided funds to allow the installation of a basic weather station in the Shasta Valley in close proximity to irrigated areas to provide necessary data. The station is located on the California Department of Fish and Game Shasta Valley Wildlife Area.



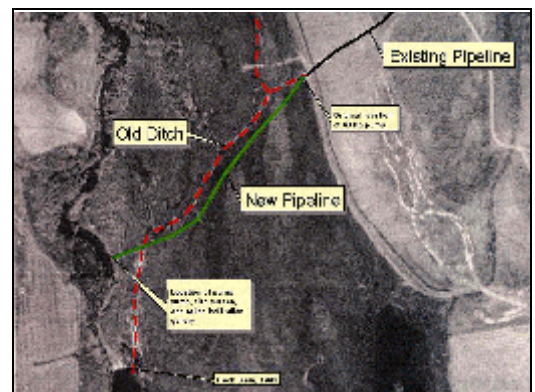
Site of installation of solar intensity pyranometer and air temperature sensor just upstream of the Montague-Grenada Road Bridge over the Shasta River.

**Fiock Energy Cost and Pipeline  
1999-HR-06  
Great Northern Corporation**

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Summer flash board dams and their impoundments on the Shasta River are degrading water quality, reducing salmon and steelhead survival, and presenting passage problems for salmon and steelhead. This report describes a 6+ year process of "trials and tribulations" to remove one of those dams while continuing to meet the irrigation needs of the dam owner.

Funds secured from a variety of sources were used to accomplish the eventual removal of the dam and its replacement with a fish screen and pump system. Funds from this grant were used for electrical operating costs during the transition while problems with the new system were resolved.



Locations of irrigation improvements on Fiock Ranch

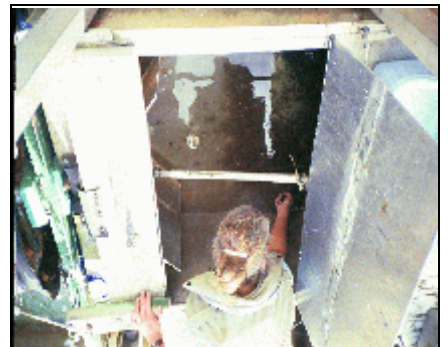
**2000 Scott River Smolt Trapping Survey  
1999-FP-17  
U.S. Forest Service/Klamath National Forest**

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The Scott River Rotary Screw Trap (RST) in 2000 captured out migrating salmonids and other species in the main river thalweg, from March to July, under a variety of flow conditions. The California Department of Fish and Game (CDFG) and the United States Forest Service (USFS) cooperated to complete the 2000 RST work. CDFG work was completed through the Steelhead Research and Monitoring Program (SRAMP - Yreka, CA). The completion of USFS work, including this report, was made possible by a grant from the Klamath River Basin Fisheries Task Force.



Objectives for this project included: a) the collection of baseline data concerning the quantity, quality, out migration timing, age, and size distributions of juvenile salmonid populations and other species in the Scott River sub-basin during the late winter through early summer period, b) the use of mark and recapture technology to determine trapping efficiencies and production estimates by species, and c) the collection of water quality information, steelhead fish scales (establish age/size relationships), and tissue collection (disease detection).



An eight-foot diameter RST was placed in the Scott River approximately 4.5 miles upstream from the Scott's confluence with the Klamath River (T45N, R10W, Section 28, HBM). Trapping occurred continuously from Sunday evening until Friday morning of each week, as conditions allowed. Captured fish were measured and released twice daily, once in the morning and the late afternoon. Other objectives including disease detection, collection of water quality parameters, scale collections, and mark and recapture activities, also occurred during the daily morning and afternoon measurement periods. Basic metrics were recorded by species and included fork length, life stage determination, and condition assessment. All data was entered into an Access database.



A total of 13,833 salmonids were captured and assessed in March-July, 2000. Chinook salmon juveniles were most frequently captured (10,531), followed by steelhead juveniles (2,413), and then coho salmon juveniles (889).



The screenshot displays the Klamath webGIS application running in a Mozilla browser. The main map area shows a grayscale topographic map of the Klamath region, with a large yellow-shaded area labeled 'Klamath' and a blue line representing a river. A scale bar at the bottom of the map indicates distances from 0 to 4 miles. A legend box in the bottom-left corner defines the map symbols: red dots for 'Projects', blue lines for 'Main Stem and Subbasin', yellow for 'citico\_nerge', green for '24k Quad', light green for 'Lakes', and brown lines for 'Roads'.

On the right side of the interface, there are several control panels:

- K2R iMap Java Enhanced Version**: The title of the application.
- Map Options**: Includes radio buttons for 'browse data' (selected) and 'query'.
- Map Controls**: Includes a 'Choose your layers:' section with a list box containing 'Land Use', 'Cities', 'Main Stem', 'Olson Fish', 'Projects', and 'Roads'. Below this is an 'Images' section with a list box containing 'zrn\_nz', 'Salmon 345', and 'Scott 345'. There is also a 'Quadrangle Index' section with a list box containing 'Quad 24k'.
- Siskiyou County Data**: Includes a list box for 'Parcels: APN' and a 'Zoning' section.
- Map Interaction**: Includes a 'Set your zoom option:' section with radio buttons for 'Zoom In', 'Pan', and 'Zoom Out'. Below this is a 'Zoom Size' input field set to '2'. A red text prompt 'Redraw a new map or Query Map' is displayed above a 'Submit' button.
- Need Help?**: A section with a 'Directions' button.
- email**: A link to an email address.

The browser's address bar shows the URL: <http://klamath.srs.furman.edu/cgi-bin/imap.cgi?map=/s2f/htdocs/s2f/klamath/s2f/2/imap.naplinged=410381.475794+4560735.247112+429149.475794+4602114.1690150>. The status bar at the bottom indicates 'Documents: Done (4,353 aec)'.

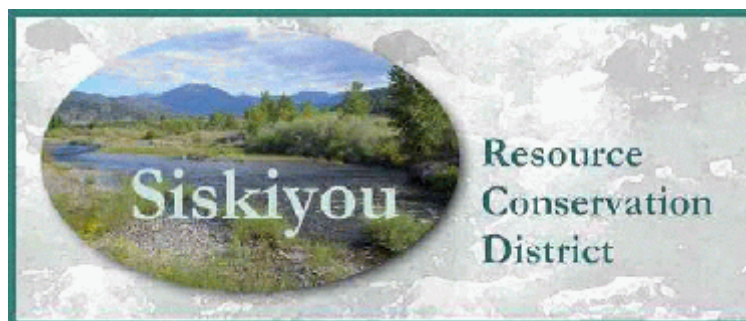


**Scott River Strategic Action Plan  
2001-PC-06  
Siskiyou Resource Conservation District**

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The goal of the Scott River Strategic Action Plan (SRSAP) is to improve the effectiveness of natural resource management and enhancement by assessing the condition of the watershed and by providing optimum implementation strategies with full consideration of the custom, culture, and economic well-being of the citizens of the community. The SRSAP was developed by integrating existing watershed-wide data, plans, assessments and references into this comprehensive work-set. The approach consisted of several steps that built upon information gathered from historical data, recent watershed assessments, and multiple planning workshops, and focused on collecting information from the public regarding natural resource management within the broader context of community enhancement and development.

Oversight of the planning process has been the responsibility of the Scott River Watershed Council (SRWC). The SRWC provides a multi-interest effort to cooperatively seek solutions, to help manage local resources, and to solve related problems. The primary role is to inform the community on resource issues, to aid in resource management, and to recommend to the Siskiyou Resource Conservation District (SRCD) prioritized project opportunities in the Scott River Watershed for funding and implementation.



**Scott River Watershed Council Coordinator  
2002-PC-04  
Siskiyou Resource Conservation District**

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The activities of the Scott River Watershed Council (SRWC) Coordinator have been funded by both the US Fish and Wildlife Service (Klamath River Basin Fisheries Task Force) and the California Department of Fish and Game. Under this contract, the Coordinator held 12 monthly public SRWC meetings; facilitated numerous monthly meetings of the SRWC's standing committees, Executive Committee, and Technical Committee; wrote and published four newsletters; sponsored two workshops or 'outreach' events; facilitated sub-watershed landowner groups; coordinated the drafting of the Scott River Strategic Action Plan; and prepared a table of SRWC's projects and accomplishments.

In addition to the expected tasks under contract, the Coordinator implemented a document driven project management tool, monthly accountability reports for budget and time contributions, and has established a quarterly forum to improve communication within agencies, stakeholders, and the SRWC. The "Scott Quarterly Information Forum" provides a place for all parties to exchange information and work together in developing methods for consistent protocol and procedure as well as to discuss common obstacles such as landowner access.

Progress reports to the funding entities have also been improved to provide a monthly list of activities and a quarterly report to specifically identify activities of each standing committee including goals for the next quarter. These reports, along with the monthly accountability reports, have been quite useful in improving the administration and management of all activities. The SRWC has also reviewed and drafted updated By-Laws that will help clarify policy and procedure. The draft update is currently being reviewed by members of the Executive Committee.

The SRWC began the development of a limiting factors analysis (LFA) to help guide us in prioritizing the needs of each anadromous fish species. The LFA is modeled after the Napa River Limiting Factors Analysis in its format. Two consultants were hired to help the SRWC's Fish Committee complete a preliminary draft LFA by early 2004.



**Lower Klamath River Sub-basin Planning and Coordination  
2001-PC-11  
Yurok Tribe**

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The Lower Klamath River Sub-basin includes all lands downstream of the confluence of the Klamath and Trinity Rivers, encompassing a drainage area of approximately 450 square miles. The main cause of impaired anadromous fishery habitat in the Lower Klamath River Sub-basin is sedimentation resulting from intensive logging and road building on naturally fragile slopes in the 1950's to 1970's, (Balance Hydrologics, Inc., 1995). Hillslope improvements and the decommissioning of the forest roads have been determined to be the most important methods of restoring native anadromous coho salmon. Chinook salmon, steelhead trout, and Pacific lamprey populations in the Lower Klamath River Sub-basin.

To address these hillslope and road decommissioning priorities, the final draft Lower Klamath River Sub-basin Watershed Restoration Plan (Watershed Restoration Plan) was developed in 2000 and submitted to the U.S. Fish and Wildlife Service for review. Following review, the Watershed Restoration Plan was finalized during the 2001 fiscal year. In addition, a draft Operational Plan for watershed assessment and watershed restoration implementation is being prepared as a separate document that describes the work completed to date and the proposed locations for future funded projects.

With the assistance of the Klamath River Basin Fisheries Task Force, California State Coastal Conservancy, Simpson Resource Company and other cooperating entities, the Yurok Tribe has completed coastal watershed assessments of four priority watersheds. In addition, four years of watershed restoration has been conducted as part of a long-term watershed restoration effort to restore aquatic habitat conditions within Lower Klamath River tributaries to a level that supports viable, self-sustaining populations of native fish and aquatic resources.

Simpson Resource Company, California Department of Fish and Game, U.S. Fish and Wildlife Service, and other agencies work with the Yurok Tribe's Watershed Restoration Department to share information and coordinate watershed assessment and restoration efforts throughout the year.



**Klamath River Fall Chinook Age Composition Project, 2002 Run  
2003-FP-02  
Yurok Tribe**

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This report describes the data and methods used by the Klamath River Technical Team (KRTAT) to estimate age-specific numbers of fall Chinook returning to the Basin in 2002. The estimates provided in this report are compatible and consistent with the so-called Klamath River Megatable (CDFG 2003) and with the 2003 forecast of ocean stock abundance (KRTAT 2003).

Age-specific escapement estimates for 2002 and previous years, coupled with the coded-wire tag recovery data on the Basin's hatchery stocks, allow for a cohort reconstruction of the hatchery and natural components of Klamath River fall Chinook (KRTAT 2003, Goldwasser et al. 2001). Cohort reconstruction results enable forecasts to be developed of the upcoming year's ocean stock abundance, percent of spawners expected in natural areas and ocean fishery contact rates, as described in a companion report (KRTAT 2003). These forecasts are essential inputs to the Klamath Ocean Harvest Model (Mohr et al. 2001); the model used by the Pacific Fishery Management Council to forecast the effect of fisheries on the Klamath River fall chinook stock.

**Natural Resources Education Program  
2002-E-01  
Siskiyou County Office of Education**

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Since Natural Resource Education Program (NREP) began in the fall of 2000, the program has emphasized natural resources education. During the past two years, NREP coordinators have served more than 22,000 students and worked with over 200 teachers. NREP has also put an emphasis on recruiting volunteers. We realized that we could not run a sufficient program without tapping into our local communities. In two years, NREP has recruited over 1,500 volunteers, with these volunteers donating nearly 4,500 hours. This is an amazing accomplishment and a highlight for our program. One of the things that is stated within the Task Force grant application is to make the dollars go as far as possible. The Task Force has given NREP the opportunity to do that. The knowledge that these volunteers share with the students goes far beyond programs that we create.

It is the uniqueness of the NREP program that keeps schools enthused. Not only does NREP provide natural resources and watershed education, but it also provides the schools with a person to help plan and implement these programs. In 2001/02 the NREP program continued its support of the Aquarium Incubator Project, Cooperative Spawning Ground Surveys, and aquatic insects and water quality studies. Streambed Restoration Projects were added to the list of projects NREP was involved with. We took the lead on Science Fun Day, held at College of the Siskiyous, and many in-class and field activities. With the success of this year's program, NREP plans on expanding its area of service for the 2002/03 year.



Students and Coordinator posing with Aquarium used in Aquarium Incubator Project.

**Middle Klamath and Salmon Rivers Research Library  
2002-E-02  
Salmon River Restoration Council**

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Standard library science methods were used to develop a print and digital specialized information resource which pertains to natural and cultural resources in the Mid-Klamath/Salmon River region of the Klamath Basin. Planning efforts included conducting a survey of the potential library group, and developing a strategic plan and collection development policy based on the results of the survey. Library space was developed at the Orleans Community Computer Center and on the web at: <http://www.klamathsalmonlibrary.org>. Selections for an initial library collection were made after a prioritized bibliography of desired acquisitions was developed. The library project was successfully completed, resulting in a solid foundation for growth of a potentially major information resource for professionals and other researchers concerned with the Klamath River watershed and its mid-river tributaries.

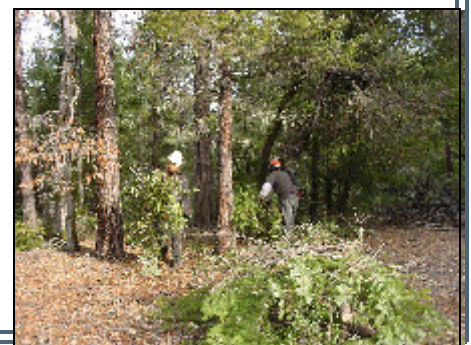


**Salmon River Fuels Reduction Project  
2002-HR-03  
Salmon River Restoration Council**

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This project has enlisted private property owners from the community to steward their lands over time in a fashion that is consistent with ecosystem management over the larger landscape. The Salmon River Restoration Council (Council) has provided a crew of displaced timber workers from the community to construct fuel break systems, and perform project inventory and monitoring tasks on several parcels of private property in the Salmon River sub-basin. Activities also included burning and chipping of hundreds of piles created under a Jobs in the Woods grant. New restoration activities took place on approximately 15 acres. This project also allowed us to work on several Forest Service "Special Use Permit" properties on public land in the Salmon River.

Tasks in this project have been performed in consultation with the USFWS, the USFS and the Karuk Tribe of California. This collaborative approach should be a major component of a comprehensive fuels reduction program on the Salmon River. The project has expanded community and agency support for the Council and help in the recovery and protection of the Salmon River sub-basin.



**Bogus Creek Salmon Studies  
2002-FP-01  
California Department of Fish & Game**

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The California Department of Fish and Game operated a fish marking weir and conducted carcass surveys on Bogus Creek in the fall of 2002. The primary purpose of the study was to determine the escapement of fall-run Chinook salmon and describe the general characteristics of the spawning run. The Chinook spawning run began on about September 28<sup>th</sup> and migration into the creek ended around November 9<sup>th</sup>. The peak of the spawning run occurred between the 16<sup>th</sup> and the 31<sup>st</sup> of October.

Approximately 12,575 chinook salmon were estimated to have entered Bogus Creek during the 2001 spawning season. Based on length frequency analysis, the run was comprised of 11,927 adult fish (94.8%) and 648 grilse (5.2%). Females comprised approximately 59% (7,419 fish) and males comprised the remaining 41% (5,156 fish). Female chinook salmon exhibited an average fork length of 77 cm and ranged in fork length from 49 cm to 99 cm. Male chinook salmon exhibited an average fork length of 79 cm, and ranged in fork length from 33 cm to 108 cm. Heads were recovered from 66 adipose fin-clipped chinook salmon. Of these, 40 fish were progeny originating from Iron Gate Hatchery and 26 fish had tags that were either unreadable or could not be recovered.

Based on expansion of coded wire tag data, the Klamath River Project (KRP) estimates that approximately 7,747 of the 12,575 chinook salmon, or 61.6% of the fall-run Chinook salmon run were of hatchery origin from Iron Gate Hatchery. Of these, approximately 1,665 (21.5%) were age 4 and 6,055 (78.2%) were age 3. Only one adipose fin-clipped grilse was recovered in Bogus Creek during 2001. One female coho salmon and three steelhead trout were observed at the fish marking weir during the study. No coho salmon or steelhead trout were recovered during spawning ground surveys.



Bogus Creek weir looking upstream



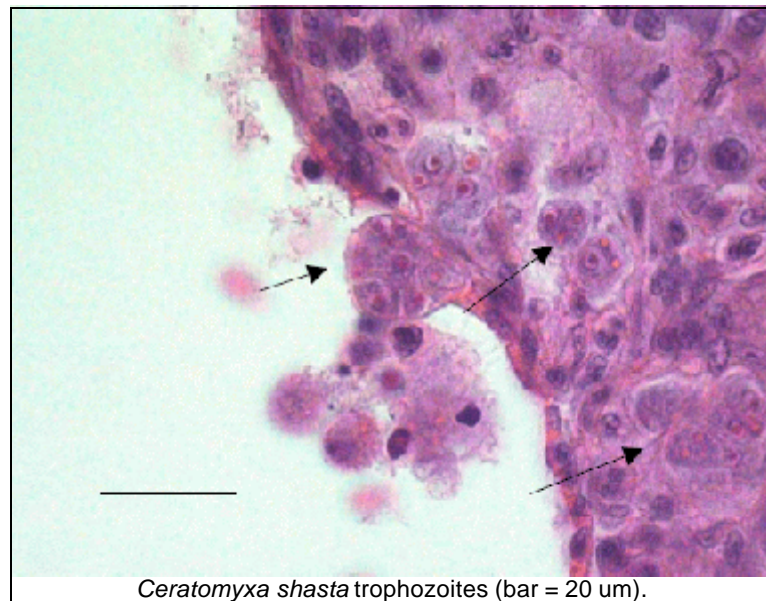


**FY 2002 Investigational Report: Ceratomyxosis resistance in juvenile Chinook Salmon and Steelhead Trout from the Klamath River**

**2002-FP-06**

**CA/NV Fish Health Center**

Both mortality and clinical signs due to ceratomyxosis were similar between juvenile chinook salmon (*Oncorhynchus tshawytscha*) infected with *Ceratomyxa shasta* and reared at 16°C and 20°C. A 3 day (d) exposure in the upper Klamath River in June 2002 resulted in 100% infection in both temperature groups and > 83% mortality within 17 d post-exposure. It is likely that the fish were overwhelmed by a highly infectious challenge. Non-specific defense mechanisms (phagocytosis, plasma complement and lysozyme activities) were not impaired in control fish reared at 20°C. Despite hypoproteinemia, plasma lysozyme activity was approximately 2X higher in infected salmon than control fish. Regardless of rearing temperature, salmon challenged with a single intraperitoneal injection of *Ceratomyxa shasta* trophozoites showed a strong inflammatory defense against the parasites. Juvenile steelhead (*Oncorhynchus mykiss*) exposed at the same site and reared at 14°, 18°, and 20°C did not develop ceratomyxosis. *Deratomyxa shasta* was not detected in the steelhead by either PCR or histology. Salmon exposed along with the trout experienced typical ceratomyxosis. Both the salmon and steelhead were from Iron Gate hatchery and considered endemic Klamath River stock. Rearing at temperatures up to 20C does not appear to suppress non-specific immune functions but can accelerate ceratomyxosis in Klamath River chinook salmon. Steelhead appear to be at low risk for ceratomyxosis when rearing or migrating in the Klamath River.



*Ceratomyxa shasta* trophozoites (bar = 20  $\mu$ m).

**Frey Ranch Tailwater Capture Project  
2002-HR-06  
Resource Management**

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The Shasta River is a major tributary to the Klamath River and is a significant producer of anadromous salmonids in the Klamath system. By early summer, salmon and steelhead rearing in the Shasta River struggle to withstand both high water temperatures, and low levels of dissolved oxygen. Numerous measures are being undertaken to improve these conditions, including livestock exclusion fencing of riparian zones, planting of trees, encouraging a narrowing and deepening of the river channel, and removal of flashboard dams. Despite the long-term importance of all these measures, one of the single most effective ways to improve water quality quickly is to eliminate the warm, nutrient-rich runoff returning to the river from irrigated fields.

Many thousands of acres are irrigated in the Shasta Valley. The standard practice is flood irrigation, which invariably results in the creation of irrigation runoff, which often ultimately adds to dissolved oxygen problems in the river. During the day, the runoff becomes hot, which can contribute to rising river temperatures. The capture and re-use of irrigation runoff is a “best management practice” that eliminates these adverse effects.

The Frey Ranch is located within the Shasta Water Association, a farmer’s cooperative irrigation district. This runoff capture project is the beginning of several similar projects that will be strategically placed to pinch off the runoff currently originating from that irrigation district.



In this project, a small pond was constructed, and a pump and sprinkler system installed. Agricultural runoff flows into the pond, accumulates over several days, then is used to irrigate a small part of the Frey property.

**Collier Interpretive and Information Center  
2003-E-06**

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The newly constructed Collier Interpretive & Information Center is located in far-northern California on Interstate Highway 5 where it intersects with Route 96 and crosses the Klamath River. A prime mission of the center is helping the public better understand the Klamath River fisheries and its anadromous fish species. The Center is in need of interpretive and educational displays in order to accomplish its mission. The object of this was to research and recommend an initial set of displays for the Center, complete with construction cost estimates and recommended sources.



**Shackleford-Mill Road Erosion Reduction Project  
1998-JITW-27  
Siskiyou Resource Conservation District**

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The Shackleford/Mill Creek sub-basin is a major tributary to the Scott River. The Shackleford/Mill Road Erosion Reduction Project is a physical project aimed at eliminating road-related sediment sources that can impact anadromous populations. The basis for selecting sites for treatment was largely a product of a sediment assessment project, the Shackleford/Mill Road Erosion Assessment Project. The assessment identified landslides and compiled data pertaining to erosion volumes on road caused erosion sites. The data identified road reaches that were of varying priorities for treatment based on contribution volumes. There were many road segments in the Shackleford drainage identified as moderate to high priorities. Given that we had nearly \$200,000 (funds and in-kind contribution) to reduce road related sediment, it was decided that all the road systems of Shackleford Creek drainage would be treated under the Shackleford Mill Road Erosion Reduction Project.



The Shackleford/Mill Road Erosion Reduction Project treated 30 miles of road. A total of 6.9 miles were hydrologically decommissioned, while the remaining road-segments were improved to reduce sediment contribution. An estimated 73,000 cubic yards of potential road related sediment sources has been treated. The property owner, Fruit Growers Supply Company, Incorporated agreed to match each dollar funded by the U.S. Fish and Wildlife Service in implementation of the project.



Much of Fruit Grower's contribution was accounted for in equipment time as their road crew completed the work. The Siskiyou Resource Conservation District is pleased with the completed product and will continue to work with Fruit Growers to monitor and maintain the project area.



**Lower Mid-Klamath Riparian Ecosystem Enhancement Project**  
**2002-JITW-02**  
**Tides Center**

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This Orleans/Somes Bar Fire Safe Council project planned and implemented approximately 23 acres of fuels reduction to create strategic fuel-breaks along Ishi Pishi Road. Displaced local timber workers were employed to treat extreme fuel loading conditions along this well traveled critical access route. The fuels treatments buffered riparian areas and wetland habitat where they cross the road, effectively mitigating the effect of potential human-caused fires. Landowners were educated in the need to protect watercourses from uncharacteristically intense wildfire through maintenance of these fuel-breaks.



Before fuels reduction.

Tasks in this project have been performed in consultation with the U.S. Fish and Wildlife Service, the U.S. Forest Service, and the Karuk Tribe of California. This project was also coordinated with a 2001 Bureau of Land Management Community Based Wildfire Prevention Grant that treated 20 acres on the uphill side of Ishi Pishi Road.



After fuels reduction.



**Scott River Reach Rehabilitation Program**  
**1998-PARTNERS-01**  
**Larry Alexander**

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The Scott River is a major tributary to the Klamath River and is a significant producer of anadromous salmonids. However, the Scott River has been designated as impaired for sedimentation and water temperature.

Historic dredge mining for gold in the 1930's and 1940's severely altered the geomorphology of the Scott River downstream of Callahan, creating six miles of tailings piles and re-routing the river from the center of the floodplain to the west side. In 1964, flooding re-routed the channel to the east side of the floodplain in the



section of the river where this project occurs. Since then, the river has continued to move eastward and erode this section, leaving vertical cut banks up to 40 feet high. This severe bank erosion was depositing approximately 3,000 cubic yards of sedimentation annually into the river.

This Partners-for-Fish-and-Wildlife project was integrated with a larger project (funded in 1999 by U.S. Fish and Wildlife's Jobs-in-the-Woods Program). The goal of these projects was to restore 1000' of the stream channel, improve anadromous fish and wildlife habitat, reduce sedimentation, and improve fish passage by encouraging year-round surface flows. The overall restoration plan included: 1) surveying and permitting, 2) building access roads to the floodplain, 3) re-contouring the floodplain to significantly widen it, slope it away from the cut banks, and route the river channel through the center of the floodplain, and 3) propagate and plant riparian vegetation. The tasks completed in the Partners-funded portion of the project included species and channel surveys, construction of two access roads, re-sloping of 400' of cut bank, photo-monitoring, and propagation of willows and cottonwoods.

**R-Y Ranch Wetland/Upland Restoration  
2002-PARTNERS-01  
Richard Peters**

Approximately 80 acres of historical wetland and upland habitats were restored and enhanced on the R-Y Ranch. Three shallow wetland areas contain approximately 35 acres of seasonal and 15 acres of permanent wetland habitat. The restoration has achieved both capital improvements and active management. Three small levees, with a maximum height of 5 feet in the low areas, have been constructed to pond water, and have at least 5:1 side slopes. Water depths vary from 3.5 feet at the levee to 2 inches at the top of the units. Average water depth is 12 inches.



RY Ranch before wetland restoration.

Additionally, flashboard risers have been installed in each levee to manage water levels within the wetland units. The material for the levees was taken from the creation of swales (underwater channels), which are used to manage water and add diversity in water depths. The spoils are used to create islands (above-water level) and loafing berms (under-water islands) that further add diversity and provide resting and foraging areas for many species of wildlife.

Approximately 11,625 feet of fencing has been constructed around the 80 acre complex and will be used to exclude cattle from the area for 10 years. The wetland area will flood naturally from seasonal precipitation and is supplied with runoff water from an agricultural runoff return system. A 12 inch pipeline (200 feet) has been installed to facilitate delivery of water from the return system to the restored wetland complex. Our wetland/upland restoration project has proven itself a success by

the large number of shore birds and waterfowl using its waters and uplands during the construction and after the completion.



Ry ranch after wetland restoration.

**Hazard Fuels Reduction Project  
2001-PARTNERS-02  
Toz Soto**

Hazard fuels (highly flammable brush and other woody material) were removed on twenty-five acres of privately owned land in the Middle Klamath River Sub-basin through a cooperative project between the U.S. Fish and Wildlife Service's Partners for Fish and Wildlife and four individual private landowners. The project goal is protection of critical wildlife and fish habitat from the impacts of high intensity wildfire.



Pearlingi property after fuels treatment.

Wild fires are an important ecological component in the Middle Klamath River Region, but because of high fuels accumulations due to fire suppression and other land management activities, the risk of high intensity fires has increased. High intensity fire can impact riparian areas, soil and slope stability, in addition to destroying mature trees important for owls and other wildlife. It is recognized by forest ecologists and local tribes that fire in the middle Klamath landscape is important for maintaining habitat diversity and forest health.



Soto property after fuels treatment.

The objective of the project was to mimic as best as humanly possible the effects of low intensity fire through removal of ground fuels (flammable wood on the ground) and ladder fuels (flammable low lying tree limbs) while retaining a tree shade canopy. Under-brush and limbs were piled and burned or chipped. The end result was an open tree under-story and closed tree shade canopy. A shaded and closed canopy will suppress brush growth and thus required less long-term fuels reduction maintenance.



**Tailwater Capture and Wildlife Habitat Project**  
**2000-PARTNERS-05**  
**James Beck**

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The priority goal of the project was to capture agricultural runoff from the Shasta River Irrigation District flood management on our property before it returns to the Shasta River. The runoff is now trapped within an impoundment and evaporates, returns to the aquifer, or is used for subsequent irrigation without impacting the water quality of the river.

The levee that holds the water is 8 feet high, 60 feet wide at the base, and 30 feet wide at the top. It stretches between two hills on our property approximately 230 yards long. It is designed to handle the "1000 year flood" should it come in the next 250 years.



We were able to catch the run-off from our second major irrigation from the Shasta River Irrigation District with the surface area of the resultant pond measuring about 1.5 acres. Should the pond ever fill completely, it will cover approximately 11 acres.

The budget for the Capture Project was \$53,000. Budgeted cost-shares from the following agencies were: California Department of Fish and Game - \$21,900.00, The Natural Resource Conservation Service - \$8,000.00, U.S. Fish and Wildlife Service - \$11,600.00, and our ranch contributed \$11,500.00. The \$11,500.00 did not include the 21 days that I was on the site supervising, surveying, and running equipment.





## Little Shasta River Fish Passage Project 2001-FISHPASS-01 Resource Management

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The Little Shasta River is a tributary to the Shasta River and is a major producer of anadromous salmonids in the Klamath system.

The upper reaches of the Little Shasta River contain stable, complex salmonid habitat due to significant spring flow and abundant riparian vegetation. In contrast, the lower reaches contain ephemeral habitat compromised by water development, sparse riparian canopy, and irrigation return flows. Agriculture and forestry are currently the dominant land uses within the Little Shasta River watershed. There are historical reports of abundant Chinook salmon (*Onchorynchus tshawytscha*) and steelhead trout (*Onchorynchus mykiss*) runs in the river.

Currently, the river supports steelhead trout, and Chinook salmon have been documented spawning in the lower section of the river for the first time in many years.

This project improved a diversion dam in the lower Little Shasta River that impeded both the passage of adult spawners attempting to migrate upstream in the fall and juvenile fish seeking refuge from high water temperatures in the summer or migrating downstream to the sea. The original diversion had been in use since 1946, and lacked a fish screen. The project replaced the porous rock dam with a concrete structure with a fish ladder, and installed a fish screen. The concrete structure impounds water using flashboards that can be removed when the diversion is not in use.



New fish ladder after installation.



New diversion dam after completion of project.



This report was prepared for the  
Klamath River Basin Fisheries Task Force

**U. S. Fish and Wildlife Service  
Yreka Fish and Wildlife Office**

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